

JUL 1 1996

B/L: 380.00
 SYS: 30-TON
 BRIDGE
 CRANES
 OPF HB-3

Critical Item: Tachometer, Bridge/Trolley
 (4 Items Total, 2 per Crane)

Find Number: AN-DC50

Criticality Category: 2

SAA No: 09FY091-007

System/Area: 30-Ton Bridge Cranes/
 OPF HB-3

**NASA
 Part No:** NA

**PMN/
 Name:** H70-1379-01/
 30-Ton Bridge Crane

**Mfg/
 Part No:** General Electric/
 AN-DC50

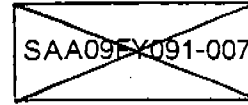
**Drawing/
 Sheet No:** Ederer EB-2286/
 13, 16

Function: Generates feedback voltage to Travel Interface Module for control of travel speed.

Critical Failure Mode/Failure Mode No: Low or No Output/09FY091-007.011 (Bridge)
 09FY091-007.014 (Trolley)

Failure Cause: Armature winding shorted, open, stuck or worn brush.

Failure Effect: Tachometer will generate a lower than expected feedback voltage. Motor controller will compensate by increasing armature current to increase motor speed and tachometer feedback voltage. Worst case would be a complete short across the windings or an open winding, either one resulting in a total loss of feedback voltage. Once enabled, the motor controller will cause an uncontrolled acceleration to 10-33% of maximum speed before the motor controller senses an armature overvoltage and shuts down the drive. The shut-down will occur within 1 second of loss of tach feedback voltage. Possible damage to flight hardware if load is within 3 inches of obstruction (trolley) or within 1 1/2 inches (bridge) when failure occurs.



ACCEPTANCE RATIONALE

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Design:

- These tachometers are off-the-shelf hardware items selected by the crane manufacturer for this application.

	RATED	ACTUAL BRIDGE	ACTUAL TROLLEY
Max. Output Voltage	250V	32.5V	42.5V
Max. RPM	5000	650	850
Min. Load Resistance	20KΩ	121KΩ	112KΩ

Test:

- Pre-operational set up (positioning sling/hook over the load) to support lifting operations in OMI Q3516 verifies proper operation of crane components and all functions.
- A full operational test of the crane is performed monthly (no load) in accordance with OMI Q6331.
- An operational check of the crane is performed under full rated load as part of the annual load test in accordance with OMI Q6331.

Inspection:

- Bridge and Trolley tachometers will be inspected per OMI Q6331 for the following:
 - Faulty or burned wiring insulation
 - Damage to conduit connections, mounting hardware, and housing
 - Brushes worn to less than 3/8 inch

Failure History:

- The PRACA database was researched and no failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange system was researched and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:
There is no action which can be taken to mitigate the failure effect.
- Timeframe:
Since no correcting action is available, timeframe does not apply.